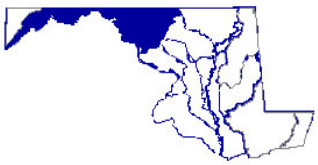
Basin Overview November 2003

Upper Potomac



Restoring the Bay:
The Land-Water Connection

The Upper Potomac River, like other tributaries to the Chesapeake Bay, is degraded by nutrient and sediment pollution harming aquatic life. Excess nutrients and sediments are the primary source of pollution in the Chesapeake Bay. Nutrients occur naturally in soil, animal waste, plants, and the atmosphere; but in the Chesapeake Bay watershed, urbanization and farming have increased nutrient loads to unhealthy levels. These nutrients – nitrogen and phosphorus – promote the growth of algae, which in turn, blocks sunlight from reaching underwater grasses and reduces dissolved oxygen and suitable habitat for aquatic life.

The Upper Potomac River

The Upper Potomac watershed, or drainage area, covers approximately 2,500 square miles of land, including all of Allegany and Washington Counties and parts of Montgomery, Frederick, Carroll, and Garrett Counties.
Larger water bodies in the basin include the Potomac, North Branch Potomac, and Monocacy rivers, Catoctin, Antietam, Conococheague, Town, Wills and Georges Creeks. There are several large reservoirs in the basin including Seneca Lake, Lake Habeeb (Rocky Gap Lake), Savage River Reservoir, and Jenning Randolph Reservoir.

The Upper Potomac, along with all tributary basins in the Chesapeake, contribute to and are impacted by nutrient pollution. Nutrient pollution can be divided into two major categories – point sources (pollution that comes from a single, definable location, such as a wastewater treatment plant or industrial discharge) and nonpoint sources (pollution that cannot be attributed to a clearly identifiable, specific physical location, such as runoff from land and atmospheric deposition). Runoff from different land uses, point sources, and atmospheric deposition are the major sources of nutrients within the Bay watershed.

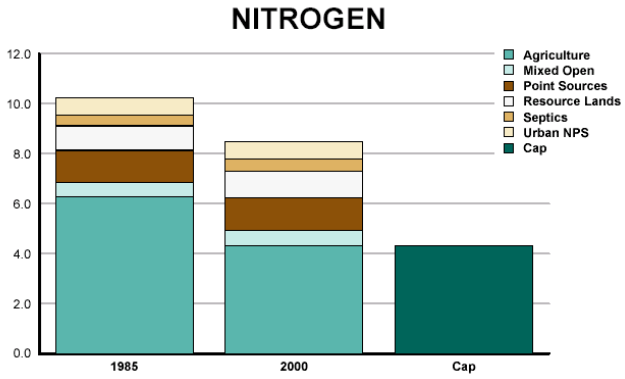
In the Upper Potomac watershed, forest and wetlands is the primary land use, and agriculture the second largest land use. While forests and wetlands are also a major land use, they release few nutrients to rivers and the Bay leaving agriculture as the leading source of nitrogen, phosphorus and sediment. Baywide, approximately 33% of nitrogen loads come from atmospheric sources, however, that varies from basin to basin and is included in land lased loads.

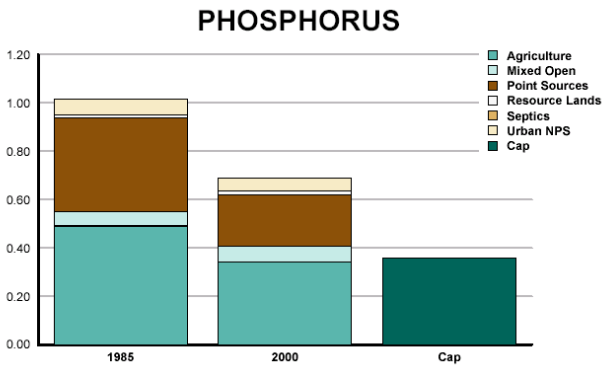
Point sources are the second largest contributor of phosphorus, and a relatively small portion of the nitrogen in the Upper Potomac, but are increasing as the population in the watershed continues to grow. Population in the Upper Potomac watershed has grown by 51 % since 1970, and is projected to grow by 82% by 2020.

A Work in Progress

Maryland has been working since the first Chesapeake Bay Agreement was signed in 1983 to reduce nutrient pollution to the Chesapeake Bay. Since 1985, wastewater treatment plants, farmers, and others have achieved significant nitrogen and phosphorus reductions. Nitrogen loads in the Upper Potomac basin have been reduced 28% from 10.2 to 8.5 million pounds a year since 1985, and phosphorus loads have been reduced 29% from 1.02 to 0.69 million pounds.

Upper Potomac Nutrient Goals





*Updated 2002 Progress information available soon

Because of the agricultural nature of the watershed, large portions of these reductions were achieved through agricultural best management practices (BMPs). These are practices or combination of practices that provide the most effective and practicable means of controlling pollutants, such as nutrient management or cover crops. In the Upper Potomac basin, nitrogen loads from agriculture dropped 28% and phosphorus loads decreased 29%, while nitrogen and phosphorus point source contributions dropped 15% and 50%, respectively. Nutrient loading from developed land increased by 24% for nitrogen and 25% for phosphorus, and is projected to increase over the coming years as projected growth occurs.

Goals for a Healthy Bay

In 2000, the Chesapeake Bay Program partners – Maryland, Virginia, Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency, and the Chesapeake Bay Commission – signed *Chesapeake 2000*, a new agreement designed to protect and restore living resources, vital habitats, and water quality in the Bay and its watershed. Key parts of this agreement include developing new nutrient and sediment goals for the Bay and its tidal tributaries based on the needs of living resources and revising the Tributary Strategies to achieve these new goals.

In the spring of 2003, the Chesapeake Bay Program finished developing water quality criteria that identify the levels of dissolved oxygen, water clarity, and chlorophyll (algae) that are needed to support healthy populations of Bay living resources. The Chesapeake Bay Program used computer models to estimate the amount of nitrogen and phosphorus loads (also called loading caps) that can enter the Bay while achieving these water quality criteria. These loads were allocated to each tributary basin and state. As a result, each basin will have nutrient reductions to be achieved in order to reach their nutrient loading cap.

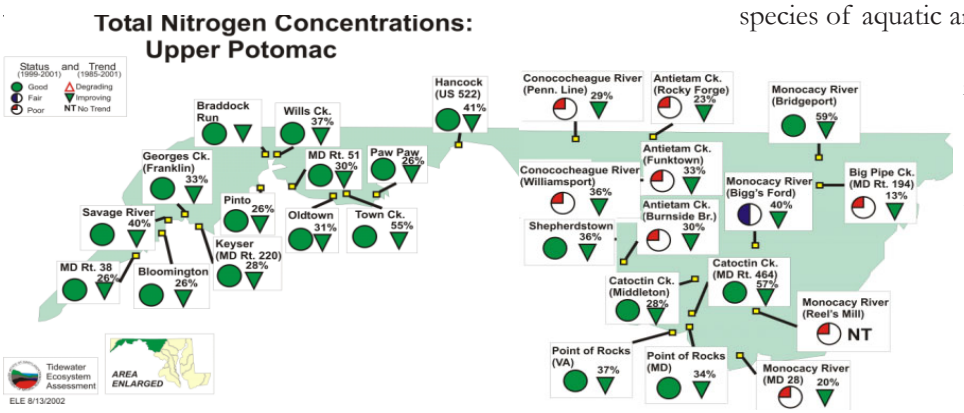
The revised nutrient caps for the Upper Potomac watershed are 2.8 million pounds of nitrogen and .21 million pounds of phosphorus.

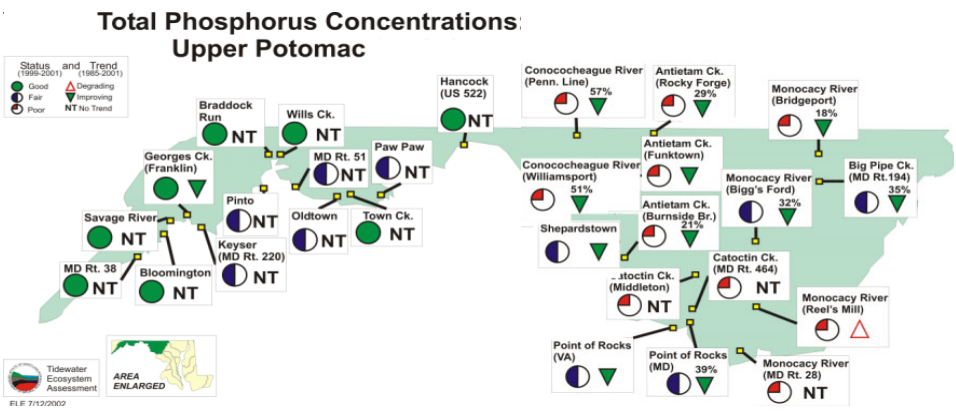
Water Quality

Monitoring data for the Upper Potomac show trends from 1985 – 2000. Over this period, nitrogen levels improved in most of the basin, while phosphorus concentrations improved in parts of the eastern portion of the basin. Nonetheless, nutrient levels remain poor in much of the eastern portion of the basin, although they are generally good in the western portion of the basin. This pattern probably is resulting from the large amount of forests and wetlands in the western part of the basin, while the eastern portion of the basin includes more agricultural and urbanized development. Sediment levels have not improved anywhere in the basin and remain high in a number of locations.

Living Resources in the Upper Potomac

The Upper Potomac watershed provides habitat for many species of aquatic and terrestrial life. The watershed supports more than 75 species of fish in its freshwater streams, including smallmouth bass, trout and walleye.



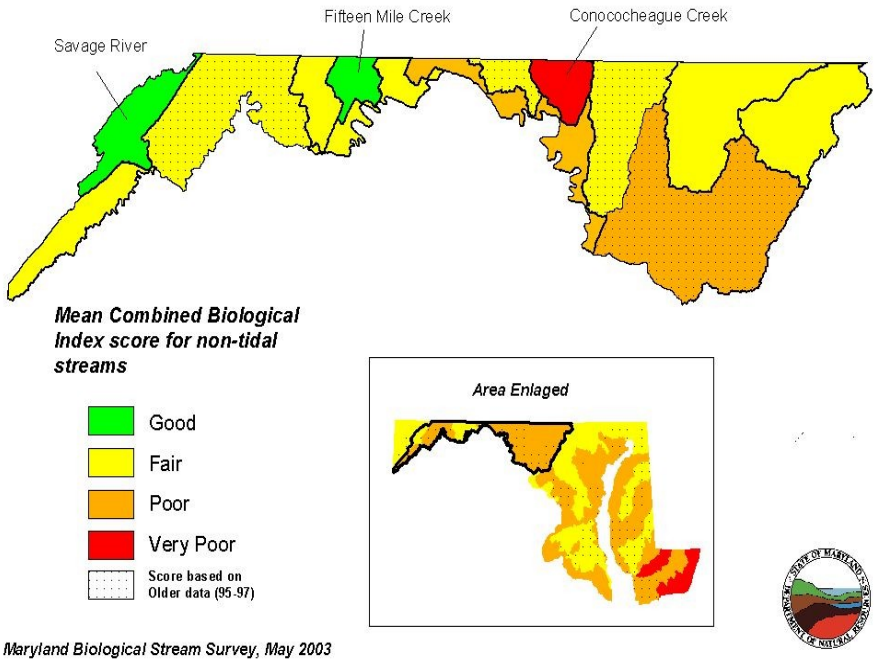


Local Benefits

By addressing nutrient and sediment pollution in the Upper Potomac basin there will be advantages both upstream and downstream. The overall result will be a decrease in algal production downstream which will aid in the return of underwater grass, but a decrease in algal production will also benefit the local system.

For nontidal areas, the Maryland Biological Stream Survey (MBSS) provides a picture of overall ecological stream health (since 1995 in this basin). Data, such as measures of the variety of species, pollution sensitivity, and proportion of exotic species, are

collected for each stream. These data are combined into one overall value, or index of health, for the streams in the Upper Potomac River watershed that is referred to as an Index of Biotic Integrity (IBI). By using this index, complex ecological information can be summarized and stream health can be rated as good, fair, poor, or very poor. Streams rated good or fair by the index are considered healthy compared to reference streams, while streams rated poor or very poor are considered unhealthy.



In the Upper Potomac River, most of the monitoring sites were rated as having fair or poor Index of Biotic Integrity scores. A few of the smaller systems were rated as good or very poor. Fifteen Mile Creek and Savage River are rated as good. Fifteen Mile Creek has an extensive forested watershed, good riparian buffers, low numbers of exotic plants observed and very little trash and pollution in streams sampled. It also has healthy fish and diverse invertebrate communities. This creek does have a low buffering ability, so these streams are sensitive to acid precipitation. The Savage River Catchment is dominated by Savage river state forest and New Germany State Park, This river has lots of cold water streams with native brook trout and has very healthy fish and bug communities.

The Conococheague Creek rates a lower IBI scores most likely associated with agricultural impacts. This creek might benefit from such agricultural BMP's, such as riparian plantings for stream bank stabilization, reducing access of cows to streams.

Addressing the quality of the streams will improve local habitat quality and healthy fish populations. As mentioned before in the Upper Potomac that means bass, trout, walleye and over 70 other species of fish. Healthy fisheries populations will not just serve as a recreational asset to the local community but often translates into an economic benefit also including eco-tourism.

Downstream Benefits

Restoration efforts in the Upper Potomac will be felt elsewhere. By achieving nutrient goals, and addressing sediment in the Upper Potomac, we will expect decreased algal production downstream, better habitat, and a resurgence of underwater grasses. The following is a description of living resource challenges and goals for the mainstem and tidal areas of the Chesapeake Bay Watershed.

Bay Grasses

Underwater grasses, or submerged aquatic vegetation, play an important ecological role to the Chesapeake Bay environment. They provide food, refuge and nursery habitat for many waterfowl, fish, shellfish and invertebrates, and produce oxygen in the water column. These grasses also filter and trap sediment clouding the water and burying bottom-dwelling organisms, such as oysters; and serve a critical role as they provide shoreline erosion protection by slowing down wave action; and removing excess nutrients that could fuel unwanted growth of algae in the surrounding waters.

Submerged aquatic vegetation had largely vanished in the Bay by the 1970s, primarily due to poor water quality. Over the past decade, improvements in water quality have led to a modest resurgence in underwater grasses in some parts of the Bay. In 2000, underwater grasses covered about 69,000 acres in the Bay. In 2003, the Chesapeake Bay Program set a new goal for underwater grasses of 185,000 acres Baywide. This was based in part on the amount of grasses that would return once we achieve the new nutrient reduction goal.

Blue Crabs

The blue crab is one of the most important species harvested in the Bay. It has the highest value of any commercial fishery and supports a recreational fishery of significant, but undetermined, value. Due to loss of habitat and harvest pressure, however, the abundance of mature female crabs is at near historic lows. The *Chesapeake 2000 Agreement* calls for the Bay partners to "manage the blue crab fishery to restore a healthy spawning biomass, size, and age structure." To achieve this, Maryland and Virginia have committed to reduce harvest pressure on blue crabs by 15% compared to the harvests of 1997 through 1999.
Restoring underwater grasses will be an important step in

restoring blue crab populations. During the 1970s and 1980s, the widespread disappearance of underwater grasses resulted in a severe loss of important crab habitat and nursery areas, primarily for females and crabs in the molting stage. Bay scientists have found that 30 times more juvenile crabs were found in Bay grasses than in areas without grass.

Oysters

Over-harvesting, dwindling habitat, pollution, and diseases (such as Dermo and MSX) have caused a severe decline in oysters throughout the Chesapeake Bay over the last century. Since the 1950s, harvests have fallen Baywide from 35 million pounds to below 3 million pounds. In addition to their fisheries value, oysters are critical to the Bay's ecosystem. They provide habitat for many Bay species and help improve water clarity by filtering algae and sediment from the water.

The *Chesapeake 2000 Agreement* commits to increasing native oysters tenfold by 2010. The Oyster Restoration Strategy, which was developed to support the agreement, focuses on rehabilitating oyster habitat, much of which is degraded by silt and nearly barren. In addition to improving habitat, the strategy aims to increase the oyster population by the construction of a Baywide network of non-harvest sanctuary areas. Up to 250 such areas have been suggested throughout the Bay so far. Protected from harvesting, it is hoped that some of the oysters in these sanctuaries will survive disease and enhance the Bay's oyster population.

Tools for Change

Maryland's Tributary Teams are leading the revision of their Tributary Strategies – watershed-based plans to achieve the nutrient and sediment goals within each of the state's 10 tributary basins. Restoring the Choptank will require the active involvement of all watershed residents. Strategies for the Upper Potomac will be drawn from an array of measures to reduce the amounts of nutrients from wastewater treatment plants and agricultural, urban, and suburban lands. Protection of forests and wetlands will help prevent increases in nitrogen and phosphorus loads.

The Next Steps

Over the coming months, the Upper Potomac Tributary Team and Maryland's Departments of Natural Resources, Environment, Agriculture, and Planning will work closely with residents of the basin to identify best management practices that can be applied in the watershed to reduce nutrient pollution and restore habitat.

These practices will be summarized in a Tributary Strategy for the basin. Funds to implement this strategy will be sought from federal, state, and local governments. Private landowners and other watershed residents will also contribute. While implementation may not be complete by the target date of 2010, every effort will be made to reach the water quality goals by that date.

For more information or how to get involved with the Upper Potomac Tributary Team:

- Upper Potomac Technical Basin Summary: www.dnr.state.md.us/bay/tribstrat/basin_summaries.html
- Maryalnd Biological Stream Survey: Upper Potomac Fact Sheet: www.dnr.state.md.us/streams/pubs/upperpotomac.pdf
- Chesapeake Bay water quality criteria: www.chesapeakebay.net
- Maryland's water quality standards: www.mde.state.md.us
- Maryland's Tributary Teams: www.dnr.state.md.us/bay/tribstrat.html

Look out for the next round of tributary strategy public meetings or get involved with your local tributary team!

Upper Potomac Team Coordinator, Claudia Donegan, at cdonegan@dnr.state.md.us or 410.260.8768

With input from the 1st public meeting in June 2003, the Tributary Strategy for the Upper Potomac basin was drafted this summer and fall by the Team and the Tributary Strategies Development Workgroup. This workgroup worked closely with state and local governments, team members, local constituents and other stakeholder groups. The working draft of the document will be available for review, and a second round of public meetings is planned for Novemberc 2003 for public review of the strategies.

Produced by the Maryland Department of Natural Resources with funds from the Environmental Protection Agency, Chesapeake Bay Program. This document does not necessarily reflect the opinion of the EPA. Printed on recycled paper.